

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code: 162604**Date: 14/12/ 2015****Subject Name: Characterization of Rubber****Time: 2:30pm to 5:00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Write the answer to the points.

Q. 1 (a) Discuss the confirmatory test for styrene butadiene rubber and chloroprene rubber respectively. **07**

Q. 1 (b) Answer the following

- i** Write down the procedure to determine the acetone extract. **04**
- ii** Give full form of ASTM. Also give its importance in characterization of rubber. **03**

Q. 2 (a) Discuss the scan of Dynamic Mechanical Analysis showing the types of transitions seen during the analysis by taking suitable example of rubber. **07**

Q. 2 (b) Discuss in detail about fractional precipitation technique with its importance. **07**

OR

Q. 2 (b) Discuss applications of the various microscopic techniques in characterization of rubber and related materials **07**

Q. 3 (a) Answer the following

- i** Write a short note on evolved gas analysis. **05**
- ii** Explain the term pyrolyzate. **02**

Q. 3 (b) Write down the main difficulties in exploitation of Transmission Electron Microscopy (TEM). **07**

OR

Q. 3 (a) Discuss in detail about the thermo gravimetric analysis of rubber with suitable example. **07**

Q. 3 (b) Answer the following.

- (i)** Write down the experimental conditions preferred for Temperature Modulated Differential Scanning Calorimetry (TMDSC). **05**
- (ii)** Define the given terms: (i) Heating Rate (ii) Plateau **02**

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- Q. 4 (a)** Discuss in detail about the classification of gas chromatography. **07**
- Q. 4 (b)** Discuss in detail about the important components of High Pressure Liquid Chromatography (HPLC) system. **07**
- OR**
- Q. 4 (a)** Describe the general classification of chromatographic method. **07**
- Q. 4 (b)** Discuss in detail about Thin Layer Chromatography (TLC). **07**
- Q. 5 (a)** Describe different sample preparation methods used in Infrared Spectroscopy (IR). Which one is preferred? Why? **07**
- Q. 5 (b)** Draw labeled diagram of Nuclear Magnetic Resonance (NMR) spectrometer. Write down the general comments concerning the use of Nuclear Magnetic Resonance spectroscopy specifically for rubber. **07**
- OR**
- Q. 5 (a)** Discuss various types of transition takes place during ultraviolet spectrometry. **07**
- Q. 5 (b)** What do you mean by monochromator? Discuss the major components of monochromator **07**
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